

(3 Hours)

[ Total Marks : 80

- N.B. :** (1) Question No. 1 is **compulsory**.  
(2) Attempt any **three** questions from remaining question.  
(3) **Assume** suitable data if **required**.

1. Attempts any **four** the following :- 20
- (a) What is double spotting ?
  - (b) Explain Eye pattern in detail.
  - (c) Explain under water acoustic channel.
  - (d) Explain low level modulated AM transmitter.
  - (e) Compare FDM and TDM.
2. (a) State and prove sampling theorem for low pass band limited signal. 8  
(b) Explain balanced modulator using FET's. 6  
(c) In an AM radio receiver the loaded Q of the antenna circuit at the input to the mixer is 100. If the intermediate frequency is 455 KHz, calculate the image frequency and its rejection at 1 Mhz. 6
3. (a) Explain what is mean by quantization noise. Explain in detail. 8  
(b) Find the mathematical expression of FM signal. 6  
(c) Draw block diagram of BPSK generation with waveform. 6
4. (a) Calculate the Max. bit rate for a channel having BW 3100 Hz and signal to noise ratio 10dB. 4  
(b) State and prove the following properties of fourier transform 8
  - (i) Time shifting
  - (ii) Convolution in time domain
- (c) Explain the term :- 8
  - (i) Shot noise and equivalent noise tempreature
  - (ii) Friiss transmission formula
5. (a) Draw and explain PCM-TDM system. 10  
(b) What are the disadvantages of tuned RF receiver ? Draw the Ckt of a superhetrodyne receiver and explain the same. 10

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6. (a) Draw nat block diagram of delta modulator and explain it's working. What are the draw backs of delta modulator ? How are they come by ADM ? **8**

(b) Write short not on :-

**12**

- (i) Noise triangle.
  - (ii) Pre-emphasis and de-emphasis.
  - (iii) White noise.
  - (iv) Properties of line codes.
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